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EXAMINER
AL NAZER, LEITH A

ART UNIT	PAPER NUMBER
2821	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/830,018	Applicant(s) AKAMATSU, NAOKI
	Examiner Leith A. Al-Nazer	Art Unit 2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *23 April 2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9 and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0037020 to Shimura et al.

With respect to claims 1, 6, and 8, Shimura teaches a laser light output apparatus comprising: a semiconductor laser (1) which has a suitable operating temperature; a driving section (5) which supplies a driving current to the semiconductor laser; a temperature sensing section (46) which senses the temperature of the semiconductor laser; an electronic temperature control section (4) which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section (5) which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature under the control of the electronic temperature control section (figure 17; paragraphs 0097-0102).

With respect to claims 2, 7, and 9, Shimura teaches a laser light output apparatus comprising: a semiconductor laser (1) which has a suitable operating temperature; a driving section (5) which supplies a driving current to the semiconductor laser; a temperature sensing section (46) which senses the temperature of the semiconductor laser; an electronic temperature control section (4) which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section (5) which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start time of the driving (figure 17; paragraphs 0097-0102).

With respect to claim 3, Shimura teaches the driving current control section determining the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving current according to the temperature sensed by the temperature sensing section (figures 21 and 22).

With respect to claims 4 and 5, Shimura teaches the initial value being a threshold current which causes the semiconductor laser to start laser oscillation (figure 3).

With respect to claim 15, Shimura teaches a driving current control method for a semiconductor laser with a suitable operating temperature, comprising: a driving current setting step of setting a driving current for driving the semiconductor laser to an initial

value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser (figure 17); a temperature control step of controlling the temperature of the semiconductor laser to the suitable operating temperature (figures 21 and 22); and a driving current changing step of changing the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature in the temperature control step (figure 17).

With respect to claim 16, Shimura teaches a driving control method for a semiconductor laser with a suitable operating temperature, comprising: a driving current setting step of setting a driving current for driving the semiconductor laser to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser (figure 17); and a driving current changing step of changing the driving current to the steady value as time elapses since the start time of the driving (figure 17).

With respect to claim 17, Shimura teaches a temperature sensing step of sensing the temperature of the semiconductor laser, wherein the driving current setting step is a step of determining the initial value according to the temperature sensed in the temperature sensing step at the start time of the driving of the semiconductor laser (figures 17, 21, and 22; paragraphs 0097-0102), and the driving current changing step is a step of changing the driving current according to the temperature sensed in the temperature sensing step (figure 17; paragraphs 0097-0102).

With respect to claims 18 and 19, Shimura teaches the driving current setting step sets the initial value as a threshold current which causes the semiconductor laser to start laser oscillation (figure 3).

3. Claims 1-9 and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,406,172 to Bennett.

With respect to claims 1, 6, and 8, Bennett teaches a laser light output apparatus comprising: a semiconductor laser (14) which has a suitable operating temperature; a driving section (76) which supplies a driving current to the semiconductor laser; a temperature sensing section (12) which senses the temperature of the semiconductor laser; an electronic temperature control section (28 and 36) which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section (22 and 32) which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature under the control of the electronic temperature control section (figure 5).

With respect to claims 2, 7, and 9, Bennett teaches a laser light output apparatus comprising: a semiconductor laser (14) which has a suitable operating temperature; a driving section (76) which supplies a driving current to the semiconductor laser; a

temperature sensing section (12) which senses the temperature of the semiconductor laser; an electronic temperature control section (28 and 36) which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section (22 and 32) which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start time of the driving (figure 5).

With respect to claim 3, Bennett teaches the driving current control section determining the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving current according to the temperature sensed by the temperature sensing section (column 3, line 40 – column 4, line 5.

With respect to claims 4 and 5, Bennett teaches the initial value being a threshold current which causes the semiconductor laser to start laser oscillation (column 3, line 40 – column 4, line 5).

With respect to claim 15, Bennett teaches a driving current control method for a semiconductor laser with a suitable operating temperature, comprising: a driving current setting step of setting a driving current for driving the semiconductor laser to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser (column 3, line 40 – column 4, line 5); a temperature control step of controlling the temperature of the semiconductor laser to the

suitable operating temperature (column 3, line 40 – column 4, line 5); and a driving current changing step of changing the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature in the temperature control step (figure 5; column 3, line 40 – column 4, line 5).

With respect to claim 16, Bennett teaches a driving control method for a semiconductor laser with a suitable operating temperature, comprising: a driving current setting step of setting a driving current for driving the semiconductor laser to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser (column 3, line 40 – column 4, line 5); and a driving current changing step of changing the driving current to the steady value as time elapses since the start time of the driving (column 3, line 40 – column 4, line 5).

With respect to claim 17, Bennett teaches a temperature sensing step of sensing the temperature of the semiconductor laser, wherein the driving current setting step is a step of determining the initial value according to the temperature sensed in the temperature sensing step at the start time of the driving of the semiconductor laser, and the driving current changing step is a step of changing the driving current according to the temperature sensed in the temperature sensing step (figures 1 and 5; column 3, line 40 – column 4, line 5).

With respect to claims 18 and 19, Bennett teaches the driving current setting step sets the initial value as a threshold current which causes the semiconductor laser to start laser oscillation (figure 5; column 3, line 40 – column 4, line 5).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0218794 to Takeda et al. in view of U.S. Patent Application Publication No. 2002/0037020 to Shimura et al.

With respect to claim 10, Takeda teaches an image display apparatus comprising: a display section (160); a light source section (110R, 110G, and 110B) which generates and outputs a plurality of laser beams differing in wavelength; and a projection section (140, 141, and 150) which processes each of the plurality of laser beams on the basis of a video signal and projects the resulting signal onto the display section, wherein the light source section includes a plurality of laser light output sections which generate and output the laser beams separately, and a balance keeping section

(130) which maintains constant the intensity balance between the laser beams outputted from the laser light output sections. Claim 10 requires that each of the plurality of laser light output sections include a semiconductor laser which has a suitable operating temperature; a driving section which supplies a driving current to the semiconductor laser; a temperature sensing section which senses the temperature of the semiconductor laser; an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature under the control of the electronic temperature control section. Shimura teaches such a laser light source. At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize the laser light source of Shimura in the system of Takeda. The motivation for doing so would have been to provide the system of Takeda with suitable laser sources.

With respect to claim 11, Takeda teaches an image display apparatus comprising: a display section (160); a light source section (110R, 110G, and 110B) which generates and outputs a plurality of laser beams differing in wavelength; and a projection section (140, 141, and 150) which processes each of the plurality of laser beams on the basis of a video signal and projects the resulting signal onto the display

section, wherein the light source section includes a plurality of laser light output sections which generate and output the laser beams separately, and a balance keeping section (130) which maintains constant the intensity balance between the laser beams outputted from the laser light output sections. Claim 11 requires that each of the plurality of laser light output sections include a semiconductor laser which has a suitable operating temperature; a driving section which supplies a driving current to the semiconductor laser; a temperature sensing section which senses the temperature of the semiconductor laser; an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start of the driving. Shimura teaches such a laser light source. At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize the laser light source of Shimura in the system of Takeda. The motivation for doing so would have been to provide the system of Takeda with suitable laser sources.

7. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0218794 to Takeda et al. in view of U.S. Patent No. 5,406,172 to Bennett.

With respect to claim 10, Takeda teaches an image display apparatus comprising: a display section (160); a light source section (110R, 110G, and 110B) which generates and outputs a plurality of laser beams differing in wavelength; and a projection section (140, 141, and 150) which processes each of the plurality of laser beams on the basis of a video signal and projects the resulting signal onto the display section, wherein the light source section includes a plurality of laser light output sections which generate and output the laser beams separately, and a balance keeping section (130) which maintains constant the intensity balance between the laser beams outputted from the laser light output sections. Claim 10 requires that each of the plurality of laser light output sections include a semiconductor laser which has a suitable operating temperature; a driving section which supplies a driving current to the semiconductor laser; a temperature sensing section which senses the temperature of the semiconductor laser; an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as the temperature of the semiconductor laser changes to the suitable operating temperature under the control of the electronic temperature control section. Bennett teaches such a laser light source. At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize

the laser light source of Bennett in the system of Takeda. The motivation for doing so would have been to provide the system of Takeda with suitable laser light sources.

With respect to claim 11, Takeda teaches an image display apparatus comprising: a display section (160); a light source section (110R, 110G, and 110B) which generates and outputs a plurality of laser beams differing in wavelength; and a projection section (140, 141, and 150) which processes each of the plurality of laser beams on the basis of a video signal and projects the resulting signal onto the display section, wherein the light source section includes a plurality of laser light output sections which generate and output the laser beams separately, and a balance keeping section (130) which maintains constant the intensity balance between the laser beams outputted from the laser light output sections. Claim 11 requires that each of the plurality of laser light output sections include a semiconductor laser which has a suitable operating temperature; a driving section which supplies a driving current to the semiconductor laser; a temperature sensing section which senses the temperature of the semiconductor laser; an electronic temperature control section which controls the temperature of the semiconductor laser to the suitable operating temperature on the basis of the temperature sensed by the temperature sensing section in a state where at least the semiconductor laser is being driven; and a driving current control section which sets the driving current to an initial value smaller than a steady value at the suitable operating temperature at the start time of the driving of the semiconductor laser and changes the driving current to the steady value as time elapses since the start of the driving. Bennett teaches such a laser light source. At the time of the invention, it would

have been obvious to one having ordinary skill in the art to utilize the laser light source of Bennett in the system of Takeda. The motivation for doing so would have been to provide the system of Takeda with suitable laser light sources.

8. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0218794 to Takeda et al. in view of U.S. Patent Application Publication No. 2002/0037020 to Shimura et al. as applied to claims 10 and 11 above, and further in view of U.S. Patent No. 6,553,044 to Eden.

With respect to claim 12, Shimura teaches the driving current control section determining the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving of the semiconductor laser and changes the driving current according to the temperature sensed by the temperature sensing section (figure 17; paragraphs 0097-0102). Claim 12 requires the balance keeping section, when the driving current control section makes the driving current of the semiconductor laser lower than the steady value in at least on of the plurality of laser light output section, forces the driving currents of the semiconductor lasers of all of the other laser light output sections to decrease. Eden teaches such a balance keeping section (column 2, line 24 – column 3, line 33). At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize the balance keeping section of Eden in the system of Takeda and Shimura. The motivation for doing so would have been to provide means for maintaining a set relationship between the outputs of the various laser light output sections.

With respect to claims 13 and 14, Shimura teaches the initial value being a threshold current which causes the semiconductor laser to start laser oscillation (figure 17; paragraphs 0097-0102).

9. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0218794 to Takeda et al. in view of U.S. Patent No. 5,406,172 to Bennett as applied to claims 10 and 11 above, and further in view of U.S. Patent No. 6,553,044 to Eden.

With respect to claim 12, Bennett teaches the driving current control section determining the initial value according to the temperature sensed by the temperature sensing section at the start time of the driving of the semiconductor laser and changes the driving current according to the temperature sensed by the temperature sensing section (figure 5; column 3, line 40 – column 4, line 5). Claim 12 requires the balance keeping section, when the driving current control section makes the driving current of the semiconductor laser lower than the steady value in at least on of the plurality of laser light output section, forces the driving currents of the semiconductor lasers of all of the other laser light output sections to decrease. Eden teaches such a balance keeping section (column 2, line 24 – column 3, line 33). At the time of the invention, it would have been obvious to one having ordinary skill in the art to utilize the balance keeping section of Eden in the system of Takeda and Bennett. The motivation for doing so would have been to provide means for maintaining a set relationship between the outputs of the various laser light output sections.

With respect to claims 13 and 14, Bennett teaches the initial value being a threshold current which causes the semiconductor laser to start laser oscillation (figure 5; column 3, line 40 – column 4, line 5).

Citation of Pertinent References

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patent documents further show the state of the art with respect to drive control methods for semiconductor laser devices:

a. U.S. Patent No. 5,438,579 to Eda et al.

b. U.S. Patent No. 5,453,833 to Kawashima et al.

c. U.S. Patent No. 5,936,987 to Ohishi et al.

d. U.S. Patent No. 6,400,099 to Walker

e. U.S. Patent No. 6,590,686 to Sekiya et al.

f. U.S. Patent Application Publication No. 2001/0026572 to Shimizu et al.

g. U.S. Patent Application Publication No. 2002/0150131 to Tsukiji et al.

Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leith A. Al-Nazer whose telephone number is 571-272-1938. The examiner can normally be reached on Monday-Friday, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LA

TUYET VO
PRIMARY EXAMINER